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complimentary copies and copies for review are finding their way unduly early to the shops of second-hand dealers.

There appears to be but one way, alike equitable and effective, to check the increasing importunities of individuals and institutions for the free receipt of sets of our publications and to avoid the abuses which have arisen from an attempt to deal generously with authors in the distribution of complimentary copies. This way is to limit the omnia list to its present dimensions and to cut down the authors' list to a minimum which will prevent those abuses. The executive committee at its meeting of October 23, 1907, authorized such a restriction of the omnia list and the president desires to recommend in the near future a similar restriction of the presentation lists.

STORAGE AND SALE OF PUBLICATIONS

As shown in the earlier parts of this report, the publications of the institution have accumulated at a rapid rate. Assuming that something like a stable state of affairs is now attained, it would appear that with an appropriation of one tenth of the annual income for publications an average of 25 volumes per year may be advantageously published. If these are issued in editions of 1,000 copies each, books must be expected to accumulate at the rate of 10,000 to 15,000 volumes per year for some years, unless sales increase more rapidly than during the past three years.

Provision must be made, therefore, for more adequate storage room in the near future. Such room is provided for by the plans for the proposed Administration Building, which it is hoped may be erected within two years. In the meantime use is being made of the available storage room in the attic of the Geophysical Laboratory, where the risk of loss from fire is much less

than in the present office quarters of the institution.

As to the possibilities of sales of publications, it appears plain from a study of existing trade conditions, as well as from the accumulating experience of the institution itself, that 500 to 700 copies of each volume of our published works will be needed to meet a normal commercial demand; so that to supply the omnia list and the trade our standard edition of 1,000 copies is essential. But to secure this normal commercial demand the institution must strictly limit the gratuitous distribution of its books and let them pass on their merits through the legitimate channels of trade. Believing this method of distribution to be the best one in the interests of society as well as in the interests of the institution, it is hereby recommended for early adoption.

SCIENTIFIC BOOKS

The World Machine. By CARL SNYDER. New York, Longmans, Green & Co. 1907. Pp. xvi + 488.

The perusal of this volume calls to mind the clean-cut dilemma in which a recent writer¹ shows we are placed when we examine the question of man's relation to his environment in a way sufficiently comprehensive to include the problem of his consciousness and his knowing as well as that of the physical objects of which he has knowledge. Either knowledge itself and all mind and consciousness are in some sense a product of inorganic and organic evolution, or, conversely, this physical evolutionary process is in some way conditioned by that very act of knowing or existence of mind. Either "matter" or consciousness must be chosen as the "end-term." The former position seems to appeal most to the "scientists," although it is found by the far-thinking among these to meet with certain serious difficulties in its completion. On

¹ Professor F. J. E. Woodbridge in *Studies in Philosophy and Psychology*, "The Problem of Consciousness," Houghton, Mifflin & Co., 1906.

the other hand, the second is the conclusion accepted by the idealist and phenomenalist in philosophy and even by some of the scientists.

The present volume proves to be really an endeavor to make a contribution in support of the first position. However, the argument by which the author supports this view consists only in an account of the grosser structure of the cosmical universe which he presents by relating the more important historical discoveries in astronomy and physics. The major portion of the book is, then, only a rewritten history of astronomy; a few other chapters are added treating of speculative, yet germane subjects, such as the origin of life, etc. In its production, too, it is evident that little if any recourse has been had to original sources; indeed, it is not a scholarly work in an academic sense, nor is it a scientific contribution. Nevertheless, it is an example of a kind of work that deserves a welcome, and not discouragement, from academic circles. For, although Mr. Snyder is not of these, he is "with them"; he is the layman who is manifesting a keen interest in things scientific, who has acquired a large fund of general information, and who can write a style at once attractive and clear to the general reader. In these and in many other ways, perhaps, he would seem to have certain advantages over the average academic writer in the dissemination of that which to his reader will be only "knowledge for knowledge sake." Much too infrequently, indeed, do such men venture into scientific and philosophic fields, so that, when we find a work which on the whole is done as well as is this, it certainly merits welcome.

In criticism of the book it remains to be said that it reveals those deficiencies which the possession of general information, when not supplemented by accurate and detailed knowledge, usually manifests. Indeed the book is in some respects distinctly misleading, aside from the fact that many inconsistencies and contradictions are to be found, especially when the author ventures the expression of his own opinions and conclusions. And although these are perhaps to be expected in the work of a man who is more narrator than authority,

nevertheless it is probable that the lay-reader will not only overlook these, but will be gradually influenced by the announced purpose of the author to give not only history, but "the philosophy of history." For this reason, and because, too, of a number of statements distinctly idealistic in trend, the occasional decidedly flippant and scornful flings at philosophy and philosophers appear most amusingly inconsistent.

It is, then, with only a modicum of insight into philosophical evidence and the detailed technique of science, and with a total neglect of all other data bearing on the problem, that our author endeavors, by telling the story of discovery in astronomical physics, to show that the "mechanical conception of phenomena must one day end in a mechanical conception of the whole." Even the meaning of this, by itself, is doubtless obscure enough; but, as made clearer and more definite by the purpose revealed on page after page and in chapter after chapter, and notwithstanding a few explicit, yet inconsistent denials of this, the real conclusion, to which the author wishes to lead and probably will succeed in leading some of his unsuspecting lay-readers (and dogmatic scientists) is that of a thorough-going mechanistic materialism. This is the position which results, he thinks, from regarding intelligence as simply a function of a definite physical organization. Whether he is correct in this or not is not here the question. But to try to lead a reader to such a conclusion without considering any evidence at all on the other side, and to make no attempt to determine the character of such a *functional* relation, is manifestly both unfair and unscientific. Indeed, it must be said of the evidence that is presented, that much of it consists of a very crude and gross interpretation of the "mechanical conception." Of such critical analyses as those of Mach, Ward, Duhem, Poincaré and others the author appears to be wholly oblivious. Only the briefest mention, too, is made of radioactivity and its allied phenomena, notwithstanding their paramount bearing on the cosmical questions discussed.

So far, then, as the author sets up pretensions to give us a philosophy of any kind, his volume deserves only adverse criticism; in fact, it would be beneath criticism in this respect did it not exemplify a frequently recurring tendency on the part of many scientists to construct their philosophy by generalizing from what is really evidence on only one side. However, if we disregard the author's philosophical pretensions, and consider his volume as what it for the most part really is, viz., a history of astronomical discovery, written in a style unusually clear and interesting and portraying facts which will set the lay-reader to thinking, then only praise is due him for his endeavor, and may his reappearance in the two volumes on *The Mechanism of Life* and *The Social Mechanism*, which he announces, be an early one.

E. G. SPAULDING

The Sense of Touch in Mammals and Birds, with Especial Reference to Papillary Ridges. By WALTER KIDD, M.D., F.Z.S. London, Adam and Charles Black. 8vo, pp. 176; 164 illustrations.

This work, although hardly of sufficiently broad scope to justify its main title, since it treats of only a very limited region, still contributes much to our general knowledge of the character of the skin which covers the ventral chirodial surface.

After a brief introductory chapter, in which the author explains the general plan of the work, and reviews the scientific literature already published upon this subject, Dr. Kidd proceeds to the discussion, which he divides into three parts, (I.) the macroscopical, (II.) the microscopical and (III.) the physiological study of the volar and plantar skin. This work comprises a study of 86 species of mammals representing 59 genera and 9 orders; also one species each of 11 genera of birds.

The varieties of skin are classified somewhat arbitrarily as follows: *leading types*, (1) smooth epidermis, (2) corrugated epidermis, (3) scales, (4) nodules, (5) hair, (6) rods, (7) papillary ridges; *mixed types*, (A) epidermis more or less corrugated, with coarse transverse ridges on the digits, (B) corrugated

epidermis with papillary ridges, (C) nodules with papillary ridges, (D) hair with coarse transverse ridges and smooth pads. Practically no attempt is made, however, to show any morphological relationship between these various types, a phase of the investigation which would be of the greatest interest and value.

Careful descriptions are given of each species studied, and the descriptions are accompanied by many diagrams. Especial attention is given to the occurrence of the papillary ridged type of skin. This type the author finds, as have other investigators, partly covering the volar and plantar surfaces of a few of the marsupials, rodents and carnivores and of all of the prosimians; but it is in the primates that the development of this form of skin becomes so complete and universal that it is justly designated "a character of ordinal rank." However, Dr. Kidd's statement that "of course, its highest development is found in the hand and foot of man," is plainly refuted by his own excellent diagrams showing the far more highly developed patterns upon both the volar and plantar areas of monkeys, particularly below the anthropoids. Indeed, one can but see in this statement the effect of a strongly preconceived idea that the ridges and the patterns which they form are, as the author attempts later to prove, purely tactile in function, and that he assumes that they must, therefore, reach their highest development in man. As a matter of fact, in the case of the hand of man, where certainly the tactile function is most highly developed, patterns are so seldom found, except upon the apical pads, as to argue conclusively that the patterns which appear in the lower monkeys and to a certain extent in other mammals are directly associated with and determined by external pressure upon the walking pads or elevated areas, upon the surface of which they are developed.

Part II. furnishes descriptions, with illustrations from photographs and drawings, of sections through many varieties of volar and plantar skin. If these illustrations were accompanied by interpretations pointing out clearly the various features shown, they would